TracVision® BY KVH INDUSTRIES

TracVision M3 – DX Version

Linear Configuration

TracVision M3 User's Guide

TracVision M3
DX Version - Linear
User's Guide

This user's guide provides all of the basic information you need to operate, set up, and troubleshoot the TracVision M3 satellite TV antenna system. For detailed system installation information, please refer to the *TracVision M3 Installation Guide*.

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If you have any comments regarding this manual, please e-mail them to manuals@kvh.com. Your input is greatly appreciated!

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1. Introduction

This chapter provides a basic overview of this manual and your TracVision system.

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1

Using this Manual

This manual provides complete operation, setup, and troubleshooting information for your TracVision system.

Who Should Use This Manual

The **user** should refer to the "Operation" and "System Preferences" chapters to learn how to operate the system using the interface box.

The **user** or **installer** should refer to the "Setup" chapter and "Wiring Diagrams" appendix for information on configuring the system for the desired satellite(s).

The **user** and/or **servicing technician** should refer to the "Troubleshooting" chapter to help identify the cause of a system problem.

Icons Used in this Manual

This manual uses the following icons to call attention to important information:

Icon	Description
	This is a danger, warning, or caution notice. Be sure to read these carefully to avoid injury!

Icon
Description
This is an illustration of the buttons on the interface box. Gray shading indicates which button the user should press.

Typographical Conventions

This manual uses the following typographical conventions:

Text Example	Description
Press ▼MENUS to view the menu	Both the icon and the name of the button are provided.
SELECT SATELLITES	Text as it appears on the interface box display
The display shows "BRIGHTNESS"	Text in quotes is shown on the interface box display
<Satellite name>	Brackets indicate a variable value
See *"Switching Satellites" on page 16*	Cross-reference to another chapter in the manual or to a web site

Related Documentation

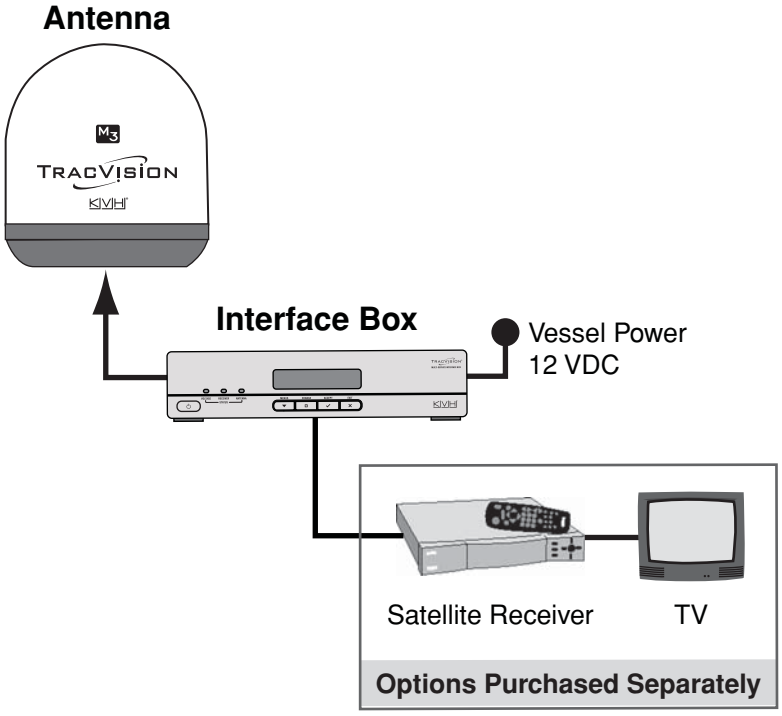
In addition to this User's Guide, the following documents are provided with your TracVision system:

Document	Description
Installation Guide	Complete product installation instructions
Quick Start Guide	Handy quick reference to basic operation and setup
Contents List	List of every part supplied in the kit

TracVision M3 System Overview

Your TracVision M3 system is a state-of-the-art, actively stabilized antenna system that delivers live satellite TV to your vessel's audio/video entertainment system. A basic system is illustrated below. A receiver wiring diagram is provided in Appendix A on page 59.

Figure 1-1 TracVision M3 System Diagram



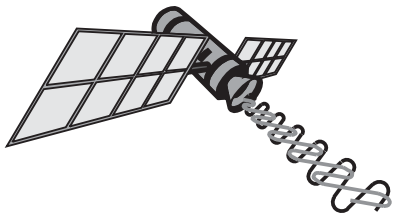
The **antenna** uses integrated DVB technology to quickly acquire and track the correct satellite, switch between satellites, and send TV signals to the interface box. Internal gyros allow the antenna to track the satellite at all times, even while you're on the move! And its advanced 37 cm (14.5") antenna design delivers signal strength, reception, and coverage comparable to larger 45 cm (18") antennas.

The **interface box** allows you to set up and control the system using its four pushbuttons and LCD display. It also supplies power to the antenna and delivers satellite TV signals to your satellite TV receiver.

Linear Satellite Signals

Your TracVision system is configured to receive linearly polarized satellite signals. Satellites around the world (with the exception of satellites in North America, which transmit circularly polarized signals) transmit linear signals in vertical and horizontal "waves" that are offset exactly 90° from each other. This orientation doubles the bandwidth, allowing the satellite to deliver hundreds of channels of digital entertainment to your vessel.

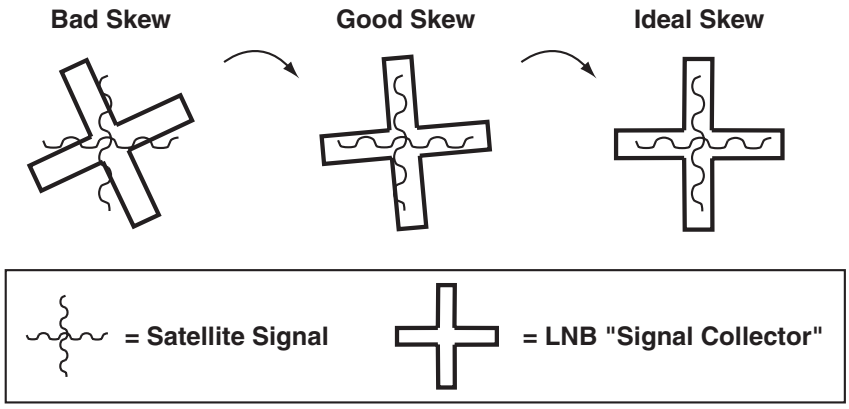
Figure 1-2 Linearly Polarized Satellite Signals



LNB Skew Angle

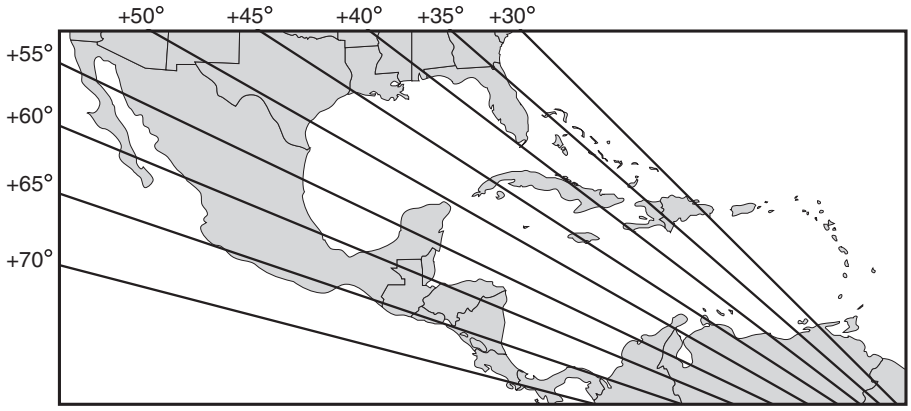
Since linear satellite signals are oriented in a precise cross pattern, the TracVision antenna's receiving element, called an LNB (low-noise block) must be oriented in the same way to optimize reception. This orientation adjustment is referred to as the LNB's "skew angle." The figure below illustrates how skew determines the amount of signal the LNB collects. The more signal, the better the reception.

Figure 1-3 How Skew Works



The correct skew setting varies depending on your geographic location, since the orientation of your antenna to the satellite changes as you move. For example, as shown in the figure below, if your antenna is tracking the PAS 9 satellite for Sky Mexico programming, the ideal skew setting ranges from +30 to +70, depending upon where you're located within the satellite's coverage area.

Figure 1-4 Approximate Skew Settings for the PAS 9 Satellite



For complete details about adjusting the LNB's skew, see *"Setting the LNB Skew Angle" on page 31*.

2. Operation

This chapter explains how to use the interface box to operate the TracVision system. It explains how to turn the TracVision system on or off, interpret the startup screens, and switch between satellites.

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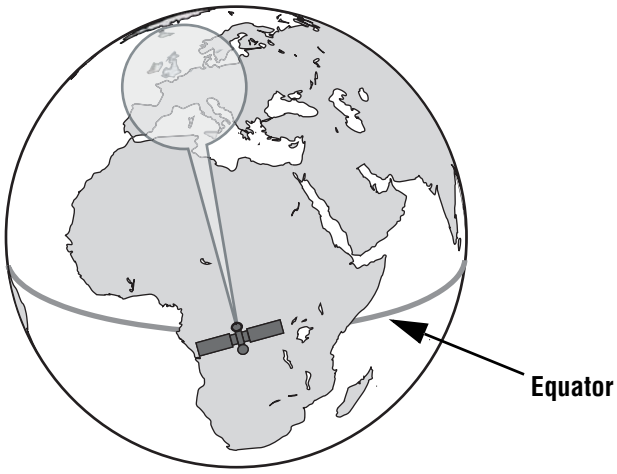
Receiving Satellite TV Signals

Television satellites are located in fixed positions above the Earth's equator and beam TV signals down to certain regions of the planet (not worldwide). To receive TV signals from a satellite, you must be located within that satellite's unique coverage area.

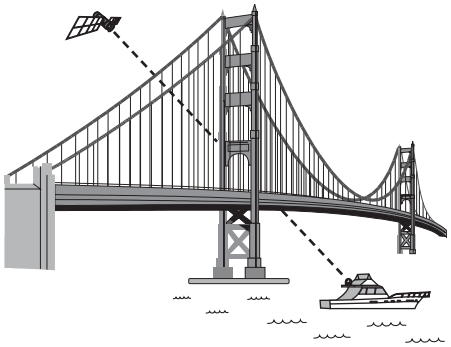
TIP: *For your convenience, KVH provides links to several web sites that offer satellite coverage information. Simply visit our web site at* ***www.kvh.com/footprint****.*

Figure 2-1 Location of Astra1 Satellite



In addition, since TV satellites are located above the equator, the TracVision antenna must have a clear view of the sky to receive satellite TV signals. Anything that stands between the antenna and the satellite can block the signal, resulting in lost reception. Common causes of blockage include trees, buildings, and bridges. Heavy rain, ice, or snow may also temporarily interrupt satellite signals.

Figure 2-2 Example of Satellite Blockage



Turning the System On/Off

Since the interface box supplies power to the antenna, you can turn the antenna on or off using the interface box ⏻POWER switch.

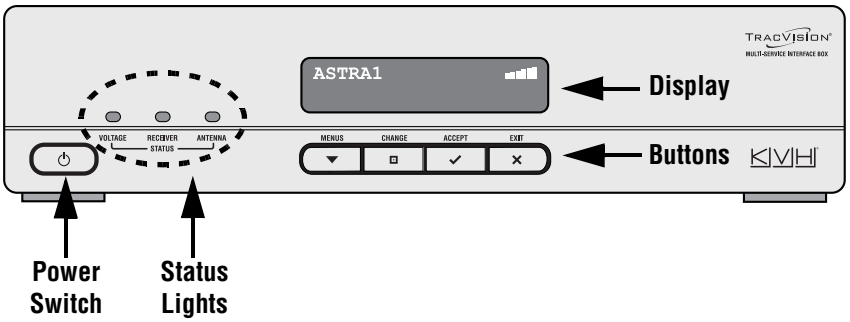
Turning On the System

Follow the steps below to turn on your TracVision system.

1. Make sure the antenna has a clear view of the sky.
2. Turn on your satellite TV receiver and TV.
3. Press the ⏻POWER switch on the front of the TracVision interface box.
4. Wait one minute for system startup.

Once the antenna finds the correct satellite, all three status lights on the interface box should be lit green. If any lights are not lit green, refer to *"System Status Lights" on page 40*.

Figure 2-3 Interface Box Components



Turning Off the System

Follow the steps below to turn off the TracVision system.

1. Press the ⏻POWER switch on the front of the TracVision interface box.
2. Turn off your satellite TV receiver and TV.

System Startup

The display shows the following screens during startup.

Interface Box Screen	Description
KVH INTERFACE BOX VERSION X.YZ	Interface box software version
KVH TRACVISION M3 SYS SW VERSION X.YZ	Antenna model and main software version
KVH TRACVISION M3 RF SW VERSION X.YZ	Antenna RF software version
INSTALLED SATELLITES HOTBIRD, THOR	Satellite(s) installed for tracking
LAT/LONG: 55N, 012E	Latitude and longitude that you last set in the antenna (or factory default lat/long); see *"Entering Latitude/Longitude" on page 22* for details on entering your position
HOTBIRD SKEW:-12.5 CHECK LNB SETTING or AVERAGE SKEW:-12.3 CHECK LNB SETTING	Recommended LNB skew angle setting **If only one satellite is installed**, shows the ideal skew for that satellite; **If multiple satellites are installed**, shows the average skew for all installed satellites
INITIALIZING ANTENNA	Antenna performs self-test
SEARCHING HOTBIRD	Antenna searches for the selected satellite

Warning Messages on Startup

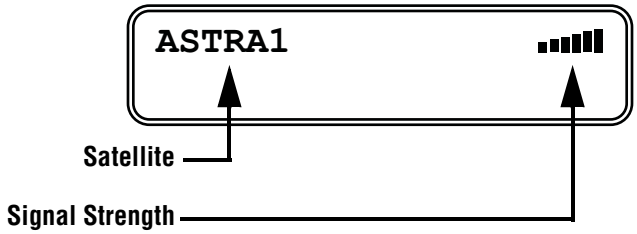
During startup, make sure none of the following warning messages appear on the display. If one of these messages appears, you may need to change your antenna setup to select a different set of satellites (see *"Resetting the System to Change Setup" on page 34*), or you may simply need to update the latitude/longitude stored in the antenna (see *"Entering Latitude/Longitude" on page 22*).

Warning	Description
WARNING! WIDE SKEW RANGE: 14	The average skew may not provide adequate reception for all installed satellites. The satellites are too far apart from each other in the sky.
WARNING! SATELLITE OUT OF ANTENNA RANGE	The antenna is not able to track one of your installed satellites because your vessel is not located within that satellite's coverage area, based on the latitude/longitude you have set in the antenna.
SYSTEM SAT MISMATCH PRESS ✓ TO FIX	The interface box and antenna are out of sync. Just press ✓ACCEPT to synchronize.
SAT NOT INSTALLED	The receiver is tuned to a channel carried by a satellite that is not installed in the antenna.

Understanding the Status Screen

Following startup, the interface box display shows the current system status.

Figure 2-4 Interface Box Status Screen



Screen Field	Description
Satellite	Satellite that the antenna is currently tracking
Signal Strength	Strength of the satellite TV signal, as measured by RF level *The more bars, the stronger the signal, just like a cell phone. Three bars = good reception.*

NOTE: *If your system is set up for manual satellite switching, the status screen differs somewhat. See the following page.*

"System Needs Setup"

If the interface box shows "System Needs Setup," the antenna system has not yet been configured for the satellites you wish to track. See *"Selecting Satellites to Track" on page 27* for setup instructions.

Figure 2-5 "System Needs Setup" Screen

Switching Satellites

If your TracVision system is set up to track multiple satellites, you can easily switch between them. For normal operation, keep the system set to Automatic satellite switching (factory default). If you wish to manually switch between satellites, see *"Changing the Satellite Switching Mode" on page 49*. You can identify the current satellite switching method by the format of the status screen:

Status Screen Example	Satellite Switching Method
ASTRA1	Automatic
ASTRA1 HH PUSH ⊡ TO SWITCH SAT	Manual

TIP: *Use Automatic switching for normal operation. Manual switching is generally used for troubleshooting only.*

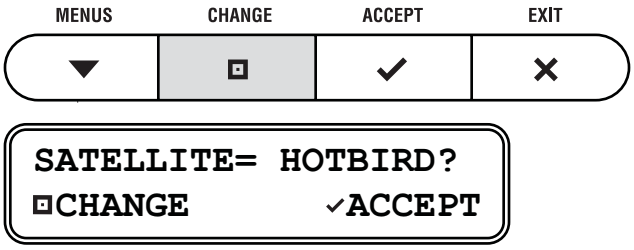
Automatic Satellite Switching

If your system is set up for automatic switching, the antenna automatically switches satellites as you change channels using the receiver's remote control. The antenna also automatically selects the correct signal polarization and band for the selected channel.

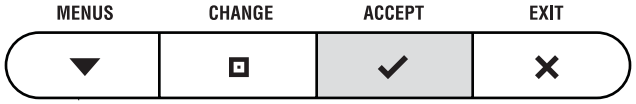
Manual Satellite Switching

If you selected Manual switching, follow the steps below to use the interface box to switch between satellites. You will also need to select the correct polarization and band for the desired channel.

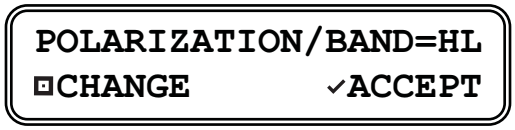
1. Press ⊡CHANGE until the display shows the desired satellite.



2. Press ✓ACCEPT.



3. Press ⊡CHANGE until the display shows the correct polarization and band for the desired channel.

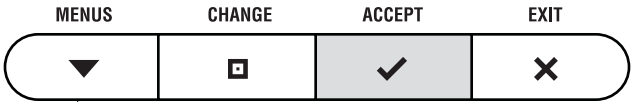


There are four possible combinations of polarization/band:

Code	Polarization	Band
HL	Horizontal	Low
HH	Horizontal	High
VL	Vertical	Low
VH	Vertical	High

TIP: *Polarization and band information for various channels is available at* ***www.lyngsat.com*** *(site not affiliated with KVH).*

4. Press ✓ACCEPT.



The antenna switches to the selected satellite and polarization/band.

NOTE: *The antenna remains in manual switching mode until you change it back to automatic switching. See* ***"Changing the Satellite Switching Mode" on page 49****.*

3. System Preferences

This chapter explains how to change the settings for display brightness and latitude/longitude. Refer to "Interface Box Menus" on page 65 for a quick reference guide to accessing these functions within the menu.

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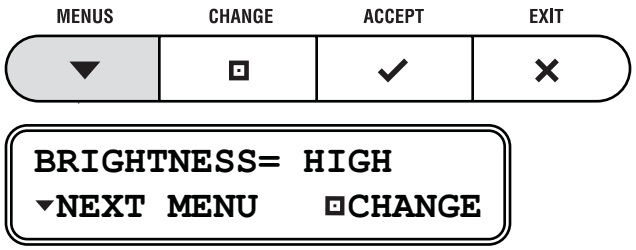
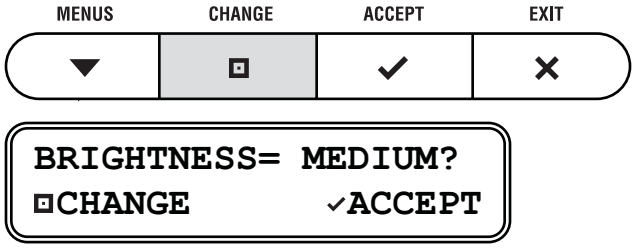
Adjusting the Display Brightness

Follow the steps below to adjust the brightness of the interface box display.

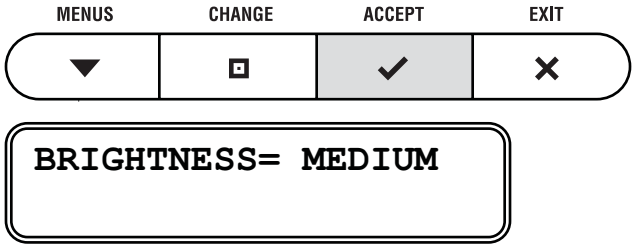
1. Press ▼MENUS until the display shows "BRIGHTNESS."



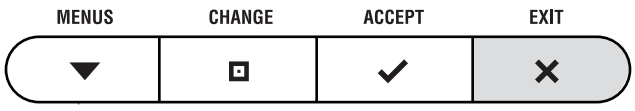
2. Press ⊡CHANGE until the display shows the desired setting: **HIGH**, **MEDIUM**, or **LOW**.



3. Press ✓ACCEPT.



4. Press ×EXIT to exit the menu.

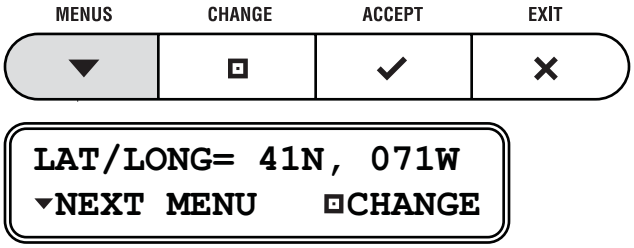


Entering Latitude/Longitude

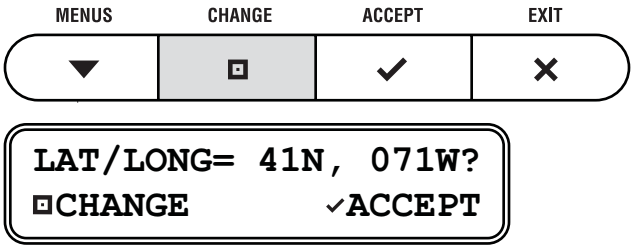
Follow the steps below to enter your vessel's latitude and longitude into the system. The antenna will use your position information to speed up satellite acquisition. (If the antenna knows where you are located, it knows where it should start looking for the satellite.) The antenna will also use this position information to calculate the correct LNB skew angle.

KVH recommends that you re-enter your latitude/longitude whenever you travel more than **600 km (400 mi)** away from the last position you entered. (The interface box displays the last entered position during system startup.) Once you have entered a new position following the steps below, check the updated skew angle that the interface box displays during restart. If the reported skew angle differs by more than **5 degrees** from the LNB's current skew angle, you should adjust the antenna's LNB to the new skew angle to optimize satellite reception. See *"Setting the LNB Skew Angle" on page 31*.

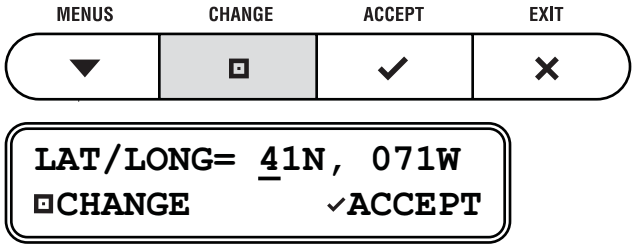
1. Press ▼MENUS until the display shows "LAT/LONG."



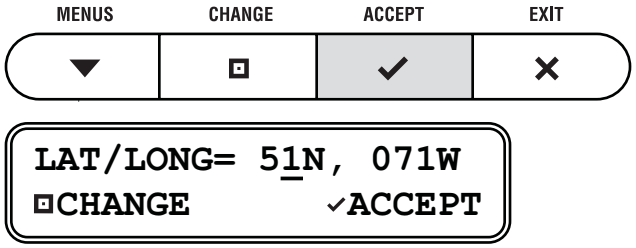
2. Press ⊡CHANGE.



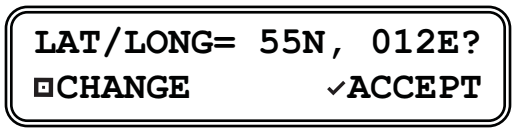
3. Press ⊡CHANGE again. A cursor appears under the first number in the displayed latitude.



4. Press ⊡CHANGE until the number is set to the first digit of your vessel's current latitude.
5. Press ✓ACCEPT. The cursor moves to the next number.



6. Repeat steps 4 and 5 to set the remaining digits (plus North/South and East/West directions) of your latitude and longitude. Once you have set the entire position, the cursor disappears from the display.



7. Press ✓ACCEPT. The antenna restarts. Wait one minute for system startup.

4. Setup

When you turn on the TracVision system for the first time, the interface box display shows "SYSTEM NEEDS SETUP." This chapter explains how to set up your TracVision system for the satellite(s) you wish to track.

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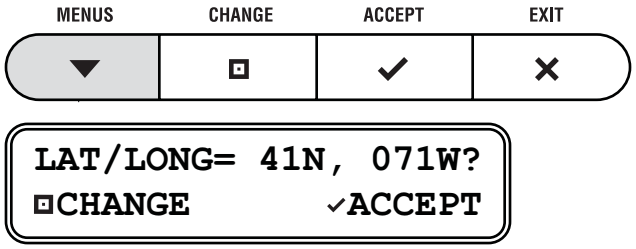
Selecting Satellites to Track

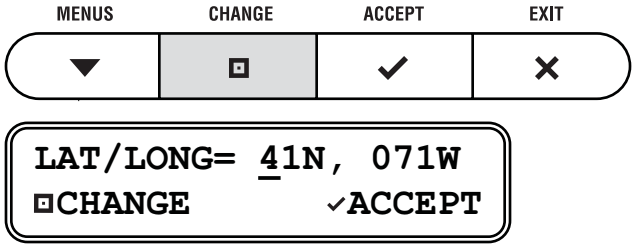
Follow the steps below to set up the TracVision system to track the satellites of your choice.

NOTE: *If the status screen does not show "System Needs Setup," follow the steps in* ***"Resetting the System to Change Setup" on page 34****.*

1. Press any button to begin the setup process.



2. The display shows "LAT/LONG." Press CHANGE.

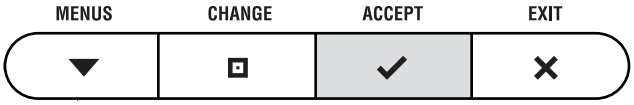


Now you need to enter your vessel's latitude and longitude so that the antenna can calculate the proper LNB skew setting for your position. The antenna will also use this position information to speed up satellite acquisition.

3. Press ⊡CHANGE until the number at the cursor is set to the first digit of your vessel's latitude.

```
LAT/LONG= 51N, 071W
⊡CHANGE       ✓ACCEPT
```

4. Press ✓ACCEPT. The cursor moves to the next number.

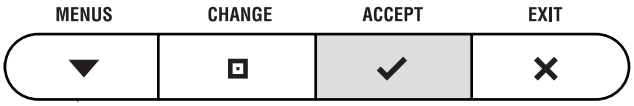



```
LAT/LONG= 51N, 071W
⊡CHANGE       ✓ACCEPT
```

5. Repeat steps 3 and 4 to set the remaining digits (plus North/South and East/West directions) of your latitude and longitude.

```
LAT/LONG= 55N, 012E?
⊡CHANGE       ✓ACCEPT
```

6. Once you have set each digit of latitude and longitude, press ✓ACCEPT.



Now you need to select the satellite(s) you want the antenna to install and track.

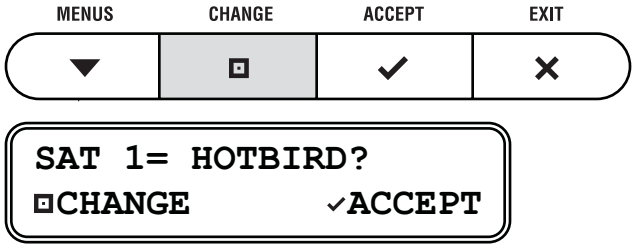
```
SAT 1= ASTRA1?
⊡CHANGE       ✓ACCEPT
```

You can choose up to four different satellites from the following list:

- ARABSAT
- ASTRA 1
- ASTRA 2N
- ASTRA 2S
- EUTEL W3A
- HISPASAT
- HOTBIRD
- HOTBIRD WB
- NILESAT
- OPTUS B1
- OPTUS C1
- PAS 9
- SIRIUS
- THOR
- TURKSAT 1C

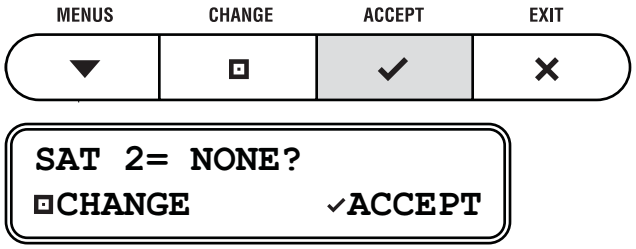
NOTE: *If the satellite you wish to track is not listed above, you can set up a special user-defined satellite (USER A or USER B). See* ***"Programming User-Defined Satellites" on page 67*** *for details.*

7. Press ⊡CHANGE until the display shows the first (primary) satellite you want to install.



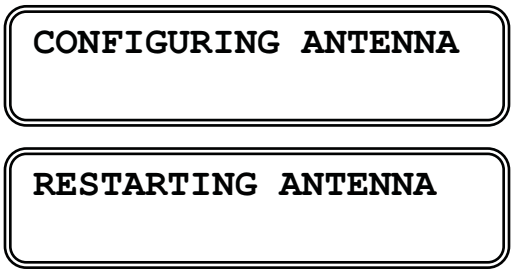
NOTE: *The display might show additional satellites not listed above. However, at this time, the TracVision M3 system supports only the satellites specified above.*

8. Press ✓ACCEPT.



9. Repeat steps 7 and 8 for the remaining satellites you want to install. If you don't need to install four satellites, select NONE instead.

   Once you have selected all four satellites, or you have selected NONE, the antenna installs the selected satellite(s) then restarts.



10. Pay close attention to the display during antenna startup. The display will show the recommended LNB skew angle setting for your selected satellite(s) and position. See *"System Startup" on page 13*.

IMPORTANT!

Be sure to adjust the antenna's LNB to the correct skew angle, as reported by the interface box during startup. See *"Setting the LNB Skew Angle" on page 31* for skew adjustment instructions.

11. Set up your satellite TV receiver for the same satellites that you set up in the antenna. See your receiver owner's manual for details.

IMPORTANT!

Be sure to set up satellites in the receiver **in the same order** that you set them up in the antenna. In other words, SAT 1 (or A) in the receiver must be set to the same satellite as SAT 1 in the antenna, and SAT 2 (or B) in the receiver must be set to the same satellite as SAT 2 in the antenna.

Setting the LNB Skew Angle

To optimize reception, the antenna's LNB (low-noise block) must be set to the correct skew angle for the satellite(s) you want to track. Follow the steps below to set the antenna's LNB skew angle.

1. First determine what the correct skew angle should be for your selected satellite(s) and position. You can find the correct skew angle by either reading the system startup screens (see *"System Startup" on page 13*) or running the Diagnostics test (see *"Running the Diagnostics Test" on page 42*).

   Check the reported latitude/longitude as well. If the interface box reports a latitude/longitude that is more than 600 km (400 mi) away from your vessel's actual position, you should re-enter your position into the interface box to obtain a more accurate skew angle. See *"Entering Latitude/Longitude" on page 22*.

   Figure 4-1 Latitude/Longitude Reported During System Startup

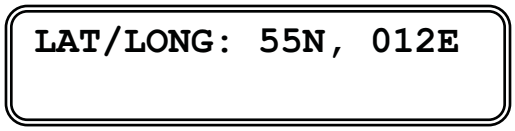
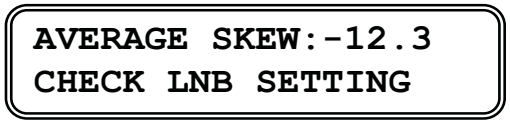
   

   Figure 4-2 Skew Angle Reported During System Startup

2. Turn off and unplug your satellite TV receiver.

3. Press the ⏻POWER switch on the front of the TracVision interface box to turn off the TracVision system. Make sure the VOLTAGE light goes out.

   CAUTION

   Disconnect power from the antenna before you remove the radome. The antenna has moving parts that can cause injury.

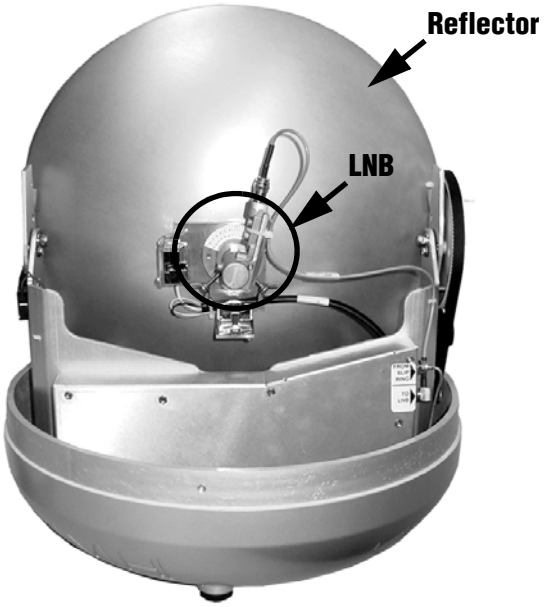
4. Remove the three #10-32 Phillips screws securing the radome to the antenna.

5. Carefully remove the radome and set it aside in a safe place.

Figure 4-3 Removing the Radome

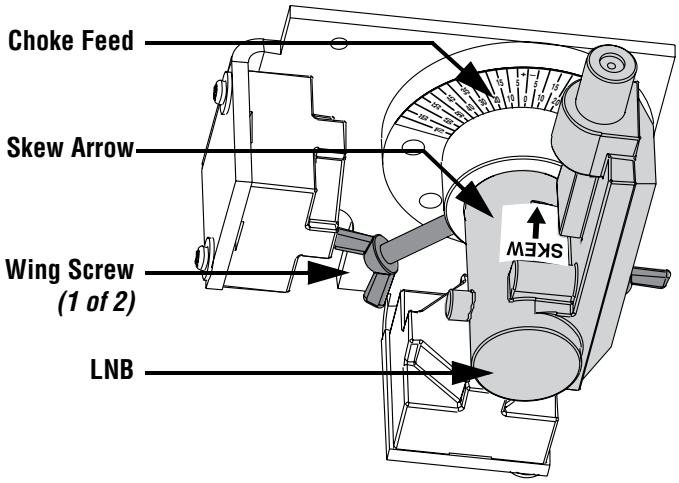
6. Locate the LNB on the back of the antenna reflector.

Figure 4-4 Location of LNB on Back of Antenna Reflector



7. Loosen the two wing screws securing the LNB to the choke feed.

Figure 4-5 LNB Skew Angle Adjustment



8. Adjust the LNB, clockwise or counter-clockwise, until the skew arrow on the LNB points to the correct skew angle on the choke feed.

IMPORTANT!

Make sure the LNB is fully inserted into the choke feed. The shaft of the LNB must be seated properly against the feed tube to ensure optimum performance.

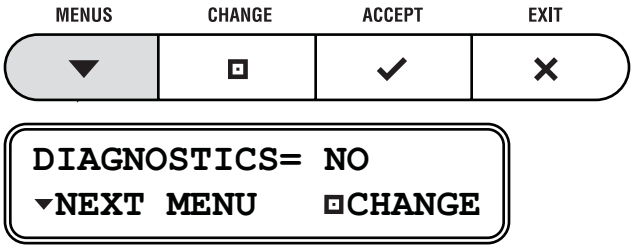
9. Tighten the wing screws.
10. Reinstall the radome.
11. Write down the skew angle somewhere so that you can easily refer to it in the future.

NOTE: *If you wish to learn more about how skew works, see* ***"Linear Satellite Signals" on page 6***.

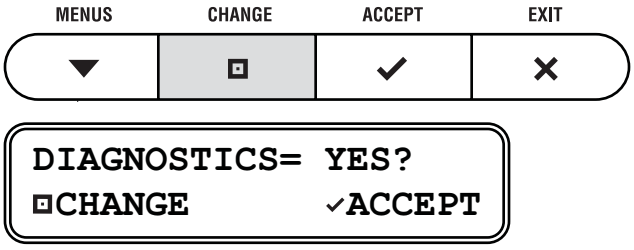
Resetting the System to Change Setup

If you need to change the antenna's setup to track a different satellite, follow the steps below to reset the system. Once the system has reset to its factory condition, you will be able to complete an initial setup as described earlier in this chapter.

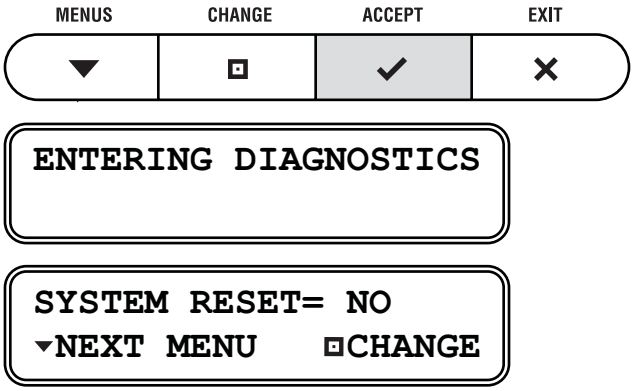
1. Press ▼MENUS until the display shows "DIAGNOSTICS."



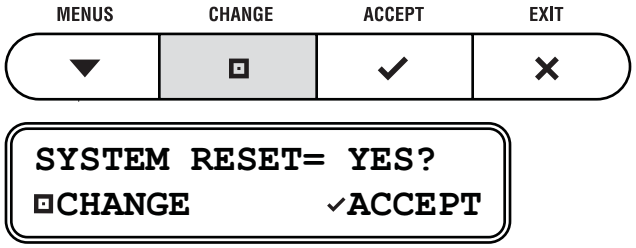
2. Press ⊡CHANGE until the display shows "DIAGNOSTICS= YES."



3. Press ✓ACCEPT to enter the Diagnostics menu.

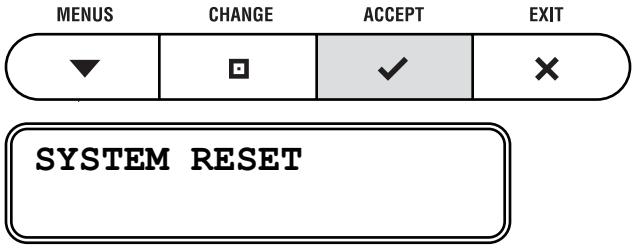


4. Press ⊡CHANGE until the display shows "SYSTEM RESET= YES."



5. Press ✓ACCEPT.

6. Press ✓ACCEPT again to reset the system. Wait one minute for system startup.



7. When the display shows the status screen, set up the system for the desired satellites. See *"Selecting Satellites to Track" on page 27* for details.

5. Troubleshooting

This chapter identifies basic problems along with their possible causes and solutions. It also explains what the status lights indicate, how to use the diagnostic functions, and how to get technical support.

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Running the Diagnostics Test 42
Viewing System Information 46
Changing the Satellite Switching Mode 49
Calibrating the Gyros 51
Changing Tracking Parameters 53
Technical Support 57
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5

Five Simple Checks

If you are experiencing a problem receiving satellite TV with your TracVision system, first check the five simple things below. If none of these are the problem, check the status lights on the interface box and/or perform a diagnostics test, as explained later in this chapter.

TIP: *You can also try resetting the satellite TV receiver. Turn off and unplug the receiver, wait one minute, then plug it back in and turn it back on.*

Can the antenna see the satellite?

The antenna requires an unobstructed view of the sky to receive satellite TV signals. Common causes of blockage include trees, buildings, bridges, and mountains.

Is there excessive dirt or moisture on the antenna dome?

Dirt buildup or moisture on the dome can reduce satellite reception. Clean the exterior of the dome periodically.

Is it raining heavily?

Heavy rain or snow can weaken satellite TV signals. Reception should improve once the inclement weather subsides.

Is everything turned on and connected properly?

Make sure the power switch on the front of the interface box is turned on (the VOLTAGE light on the front of the interface box should be lit green). Also make sure your TV and receiver are both turned on and set up for the satellite input. Finally, check the cables connecting all of these components to ensure none have come loose.

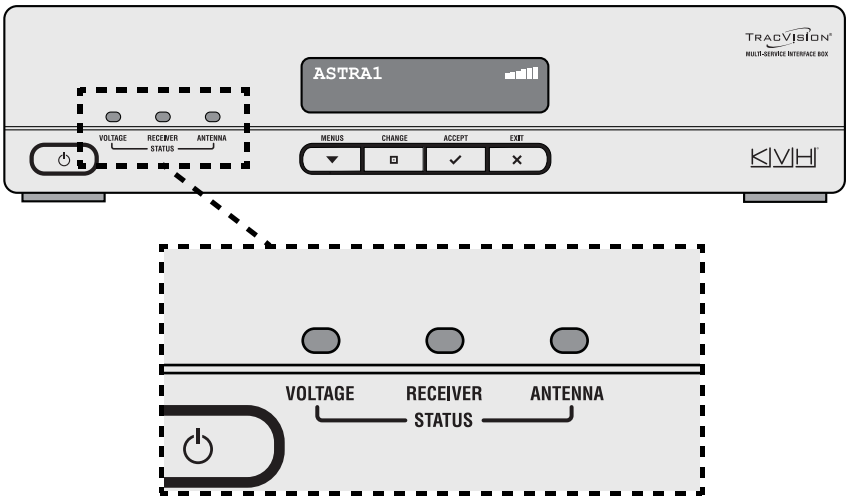
Is the antenna's LNB set to the correct skew angle?

To optimize reception, the antenna's LNB needs to be set to the correct skew angle for the satellite(s) you want to track. See ***"Setting the LNB Skew Angle" on page 31*** for details.

System Status Lights

Three status lights on the front of the receiver indicate the current status of the system and can help you identify problems.

Figure 5-1 System Status Lights



During normal operation, all three status lights should be lit green. The following tables explain what the different light conditions indicate.

VOLTAGE Light

The table below explains what the VOLTAGE light indicates.

Light is...	Indicates	Description
Off	Off	Interface box is off (power switch is off) or no power input
Green	OK	Good power (10-16 VDC at interface box)
Green, flashing	Cable open	Open detected in antenna cable (check the antenna coax connection)
Orange	Low power	Low power (9-10 VDC) at interface box
Red, flashing	Bad power	Insufficient power (less than 9 VDC or more than 16 VDC input)

RECEIVER Light

The table below explains what the RECEIVER light indicates.

Light is...	Indicates	Description
Green	OK	Good communications with receiver
Orange	No comm	No communications with receiver; receiver is off or disconnected
Orange, flashing	Overload	Overload or short circuit detected on the antenna cable
Red	Fault	Internal power fault

ANTENNA Light

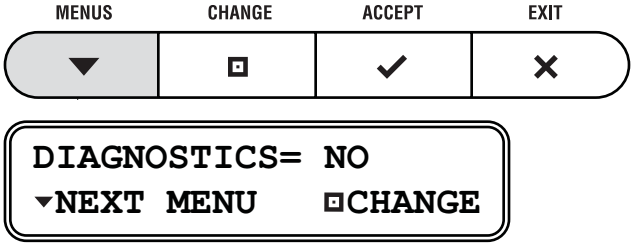
The table below explains what the ANTENNA light indicates.

Light is...	Indicates	Description
Off	Off	Antenna is off, disconnected, or has insufficient power
Green	Tracking	Antenna is tracking the selected satellite
Green, flashing	Searching	Antenna is searching for a satellite
Orange, flashing	Overload	Overload or short circuit detected on the antenna cable
Red	No comm	No communications with antenna
Red, flashing	Fault	Error detected in antenna

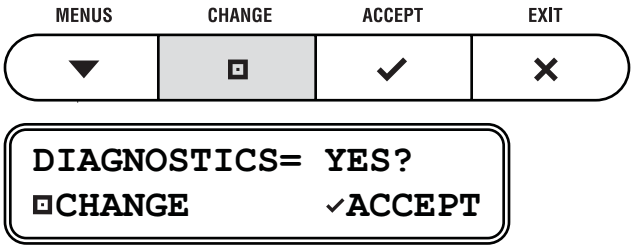
Running the Diagnostics Test

In addition to the front panel status lights, the interface box includes a self-test function within its Diagnostics menu. Follow the steps below to run this test.

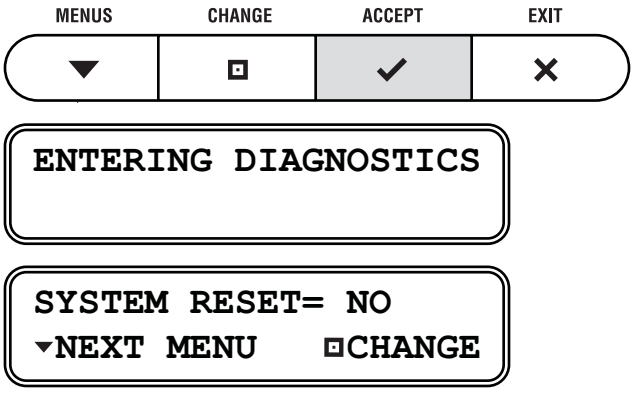
1. Press ▼MENUS until the display shows "DIAGNOSTICS."



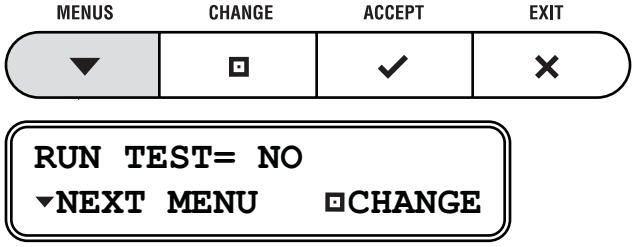
2. Press ⊡CHANGE until the display shows "DIAGNOSTICS= YES."



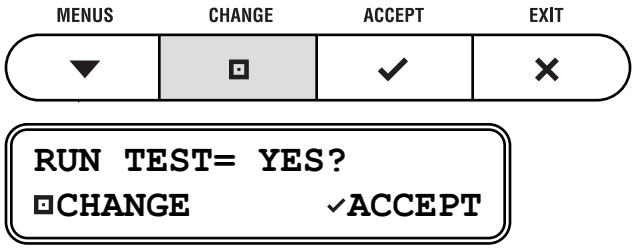
3. Press ✓ACCEPT to enter the Diagnostics menu.



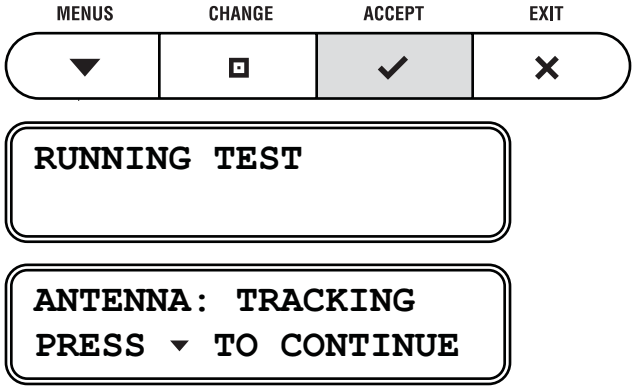
4. Press ▼MENUS until the display shows "RUN TEST."



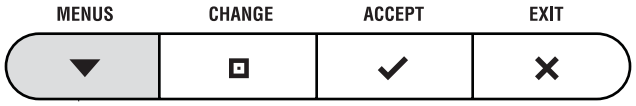
5. Press ⊡CHANGE until the display shows "RUN TEST= YES."



6. Press ✓ACCEPT to begin the test.



7. Once the test is complete, the display shows the antenna status. Press ▼MENUS to scroll through the remaining status messages.



Diagnostics Test Results

The table below lists all of the status messages.

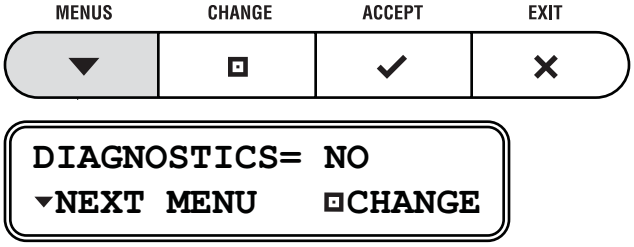
Status Message	Description
ANTENNA: TRACKING PRESS ▼ TO CONTINUE	Antenna status: Idle, Initializing, Searching, Tracking, or Error
SATELLITE: HOTBIRD PRESS ▼ TO CONTINUE	Name of the currently selected satellite
BIT ERROR: OK,928 PRESS ▼ TO CONTINUE	Bit error rate: OK: Less than 2001 High: Between 2001-8000 Bad: Greater than 8000
AGC LEVEL: OK,22500 PRESS ▼ TO CONTINUE	Automatic gain control level: OK: Between 20000-25000 Bad: Less than 20000; greater than 25000
SAT 1: HOTBIRD PRESS ▼ TO CONTINUE	List of installed satellites Press ▼MENUS to scroll through the list
LAT/LONG: 41N, 071W PRESS ▼ TO CONTINUE	Last latitude and longitude data that you entered into the system
HOTBIRD SKEW:-12.5 PRESS ▼ TO CONTINUE	Recommended LNB skew angle for each installed satellite; Press ▼MENUS to scroll through the list
AVERAGE SKEW:-10.2 PRESS ▼ TO CONTINUE	Recommended LNB skew angle if multiple satellites are installed
CABLE STATE: OK PRESS ▼ TO CONTINUE	Antenna cable status: OK, Open, or Shorted

Status Message	Description
SYSTEM DC: OK,12.3 PRESS ▼ TO CONTINUE	Input voltage (DC power): OK: 10-16 VDC Low: 9-10 VDC Bad: Less than 9 VDC or more than 16 VDC
ANTENNA DC: OK,41.0 PRESS ▼ TO CONTINUE	Antenna voltage (DC power) OK: 39-42 VDC Low: 37-39 VDC Bad: Less than 37 VDC

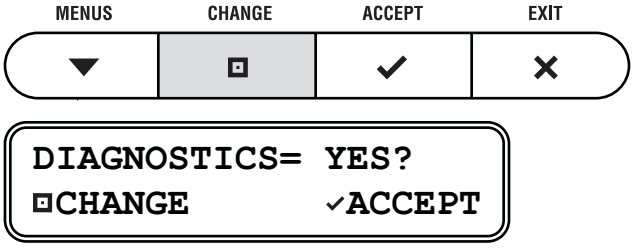
Viewing System Information

You can view the TracVision system's software versions and serial numbers on the interface box display. Follow the steps below to display the system information.

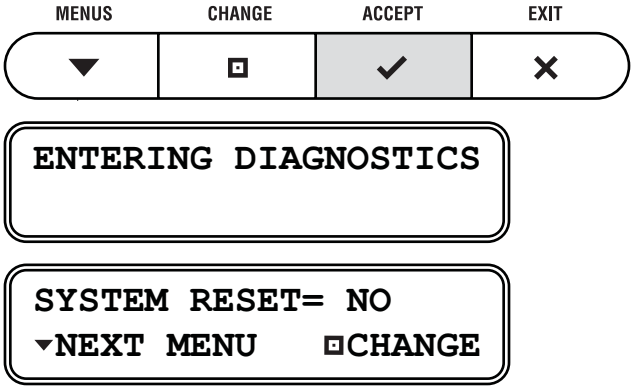
1. Press ▼MENUS until the display shows "DIAGNOSTICS."



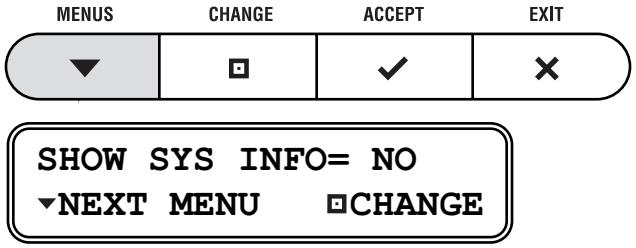
2. Press ⊡CHANGE until the display shows "DIAGNOSTICS= YES."



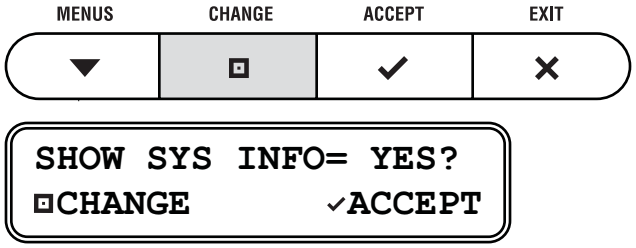
3. Press ✓ACCEPT to enter the Diagnostics menu.



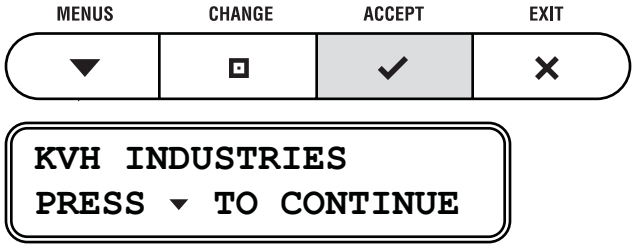
4. Press ▼MENUS until the display shows "SHOW SYS INFO."



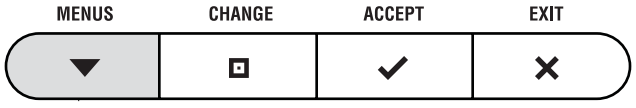
5. Press ⊡CHANGE until the display shows "SHOW SYS INFO= YES."



6. Press ✓ACCEPT to begin viewing the system information.



7. Press ▼MENUS to scroll through the list.



System Information

The table below lists all of the system information reported by the interface box.

Information Message	Description
TRACVISION M3 PRESS ▼ TO CONTINUE	Model of TracVision antenna (M3)
SYS SW: 1.2 PRESS ▼ TO CONTINUE	Version of antenna main software
RF SW: 1.3 PRESS ▼ TO CONTINUE	Version of antenna RF software
MOTOR SW: 1.4 PRESS ▼ TO CONTINUE	Version of antenna motor controller software
JBOX SW: 1.5 PRESS ▼ TO CONTINUE	Version of interface box software
ANT.SER.# 061201234 PRESS ▼ TO CONTINUE	Serial number of antenna
JBOX SER.# 061205678 PRESS ▼ TO CONTINUE	Serial number of interface box

NOTE: *The first 4 digits of the serial number indicate the year and month (YYMM) the product was manufactured. For example, if the antenna has a serial number of 061201234, it was built in December 2006.*

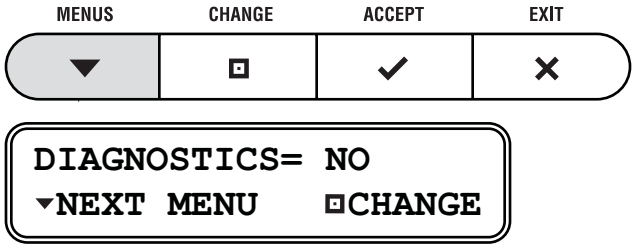
Changing the Satellite Switching Mode

During normal operation, the antenna automatically switches satellites as you change channels using the receiver's remote control. However, if you want to manually select a satellite instead, the interface box allows you to switch from automatic to manual switching (you can also switch back to automatic switching using this same menu function).

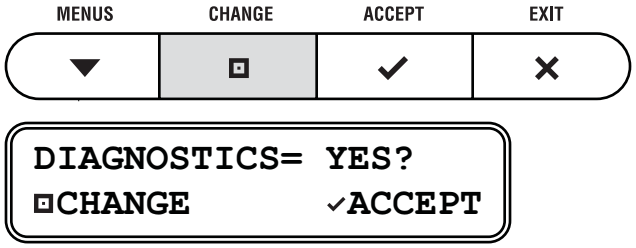
NOTE: *This function is normally used by technicians for troubleshooting purposes only.*

Follow the steps below to change the satellite switching mode.

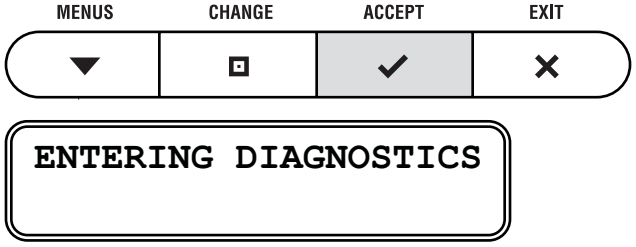
1. Press ▼MENUS until the display shows "DIAGNOSTICS."



2. Press ⊡CHANGE until the display shows "DIAGNOSTICS= YES."

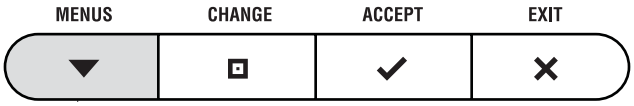


3. Press ✓ACCEPT to enter the Diagnostics menu.



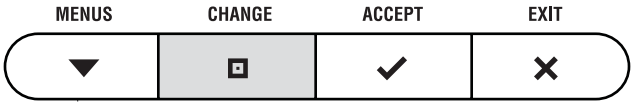
```
SYSTEM RESET= NO
▼NEXT MENU    ⊡CHANGE
```

4. Press ▼MENUS until the display shows "SAT SWITCH."




```
SAT SWITCH= AUTO
▼NEXT MENU    ⊡CHANGE
```

5. Press ⊡CHANGE until the display shows the desired satellite switching mode: **AUTO** or **MANUAL**.




```
SAT SWITCH= MANUAL?
⊡CHANGE       ✓ACCEPT
```

6. Press ✓ACCEPT.

```
SAT SWITCH= MANUAL
```

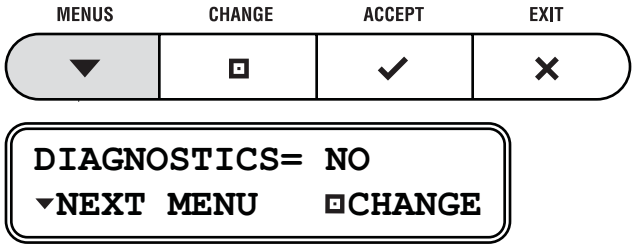
Calibrating the Gyros

The TracVision antenna's gyros continuously measure the motion of your vessel and send this data to the antenna's motor control circuitry to keep the antenna pointed at the satellite. At the factory, each antenna gyro is precisely calibrated to work with the antenna's circuit board. Therefore, if you ever replace a gyro or circuit board in your antenna, you will need to recalibrate the gyros for the new part. Follow the steps below to calibrate the gyros.

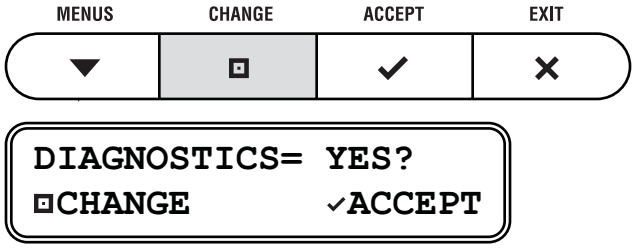
IMPORTANT!

Calibrate the gyros only if directed by KVH Technical Support, and only while the vessel is stationary. A poor gyro calibration can reduce the performance of the antenna.

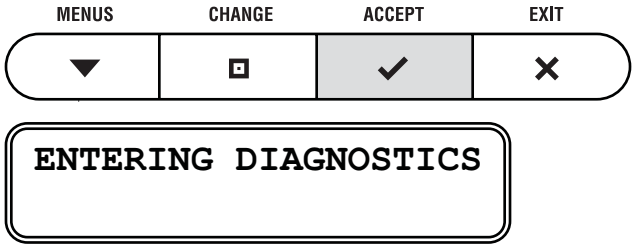
1. Press ▼MENUS until the display shows "DIAGNOSTICS."



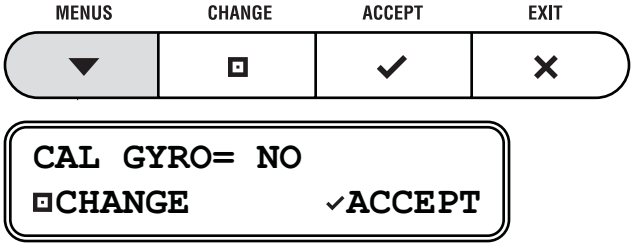
2. Press ⊡CHANGE until the display shows "DIAGNOSTICS= YES."



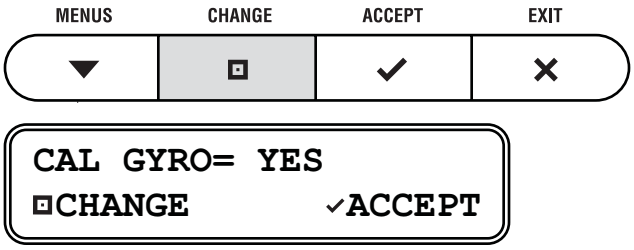
3. Press ✓ACCEPT to enter the Diagnostics menu.



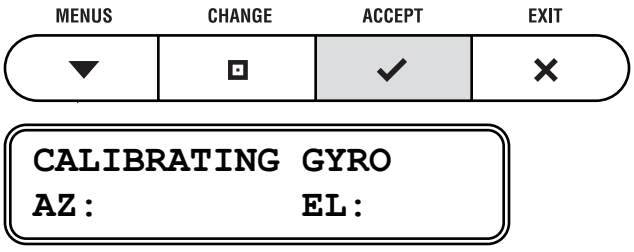
4. Press ▼MENUS until the display shows "CAL GYRO."



5. Press ⊡CHANGE until the display shows "CAL GYRO= YES."



6. Press ✓ACCEPT to start gyro calibration.



7. Verify that the azimuth (AZ) and elevation (EL) gyros both pass. If either gyro does not pass, retry the calibration. If it continues to fail, please seek technical support (see *"Technical Support" on page 57*).

8. Once the gyros are calibrated, the antenna restarts.

Changing Tracking Parameters

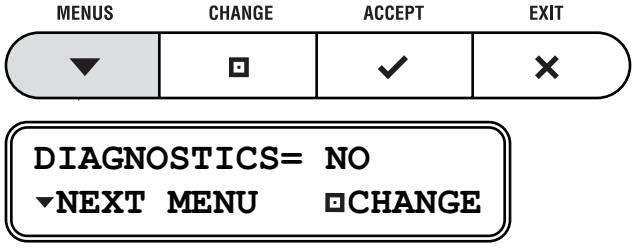
On rare occasions, a satellite service provider may change the configuration of one of its satellites. Since your TracVision antenna identifies a satellite based on the configuration data it has stored in memory, the antenna will no longer be able to track the satellite if its configuration changes. For this reason, the interface box allows you to change any satellite parameter stored in the antenna's memory.

IMPORTANT!

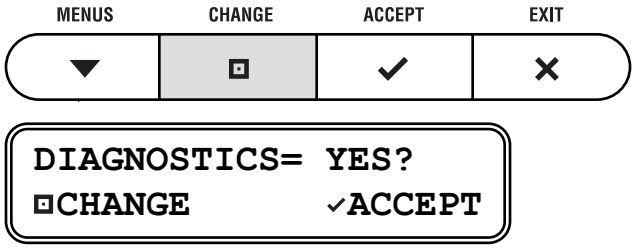
Change tracking parameters only if directed by KVH Technical Support. An incorrect tracking parameter can significantly reduce the performance of the antenna.

Follow the steps below to change a tracking parameter for an installed satellite.

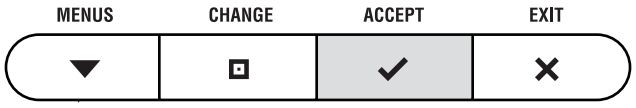
1. Press ▼MENUS until the display shows "DIAGNOSTICS."

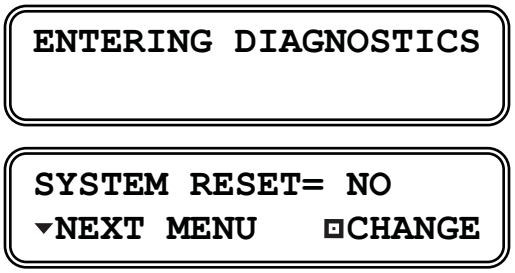


2. Press ⊡CHANGE until the display shows "DIAGNOSTICS= YES."

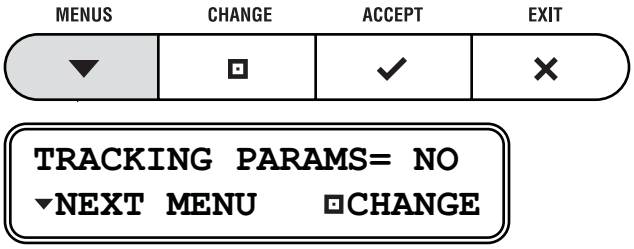


3. Press ✓ACCEPT to enter the Diagnostics menu.

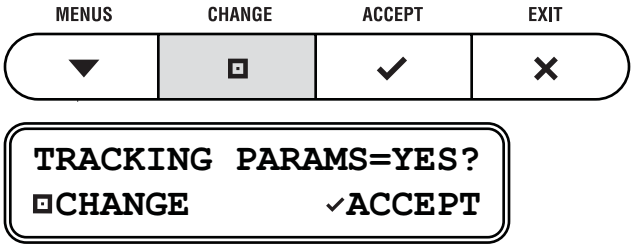




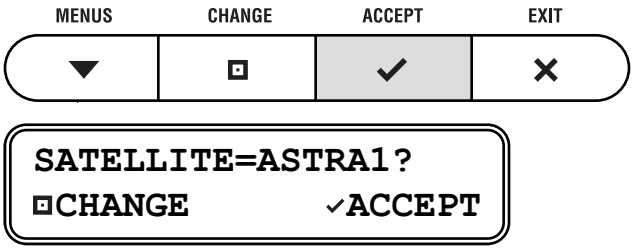
4. Press ▼MENUS until the display shows "TRACKING PARAMS."



5. Press ⊡CHANGE until the display shows "TRACKING PARAMS= YES."

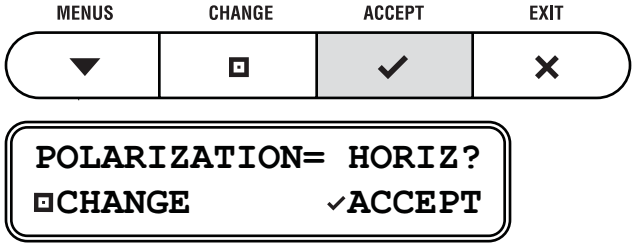


6. Press ✓ACCEPT.

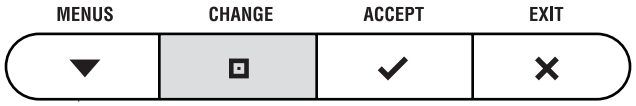


7. Press ⊡CHANGE until the display shows the satellite you need to modify.

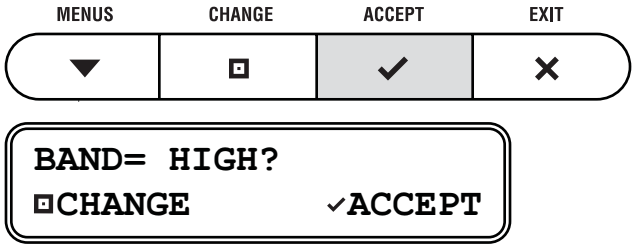
8. Press ✓ACCEPT.



9. Press □CHANGE until the display shows the polarization you need to modify: Horizontal or Vertical.

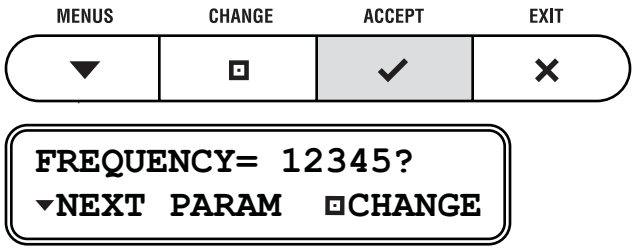


10. Press ✓ACCEPT.



11. Press □CHANGE until the display shows the band you need to modify: High or Low.

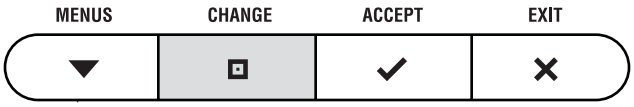
12. Press ✓ACCEPT.



13. Press ▼MENUS until the display shows the parameter you want to change. See the table below.

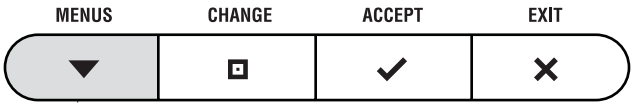
Parameter	Possible Settings
FREQUENCY= 12345? ▼NEXT PARAM ⊡CHANGE	10700-12700 MHz
SYMBOL RATE= 12345? ▼NEXT PARAM ⊡CHANGE	10000-45000 kilosymbols per second
FEC CODE= 5/6? ▼NEXT PARAM ⊡CHANGE	1/2, 2/3, 3/4, 5/6, 6/7, or 7/8
NETWORK ID= 0x1234? ▼NEXT PARAM ⊡CHANGE	0x0000-0xffff (hexadecimal)

14. When the display shows the desired parameter, press ⊡CHANGE.



15. Using the ⊡CHANGE and ✓ACCEPT buttons, change the parameter to the new setting.

16. Press ▼MENUS until the display shows "DONE?"



17. Press ✓ACCEPT to save your changes, or press ▼MENUS to repeat steps 13-16 (to correct a mistake).

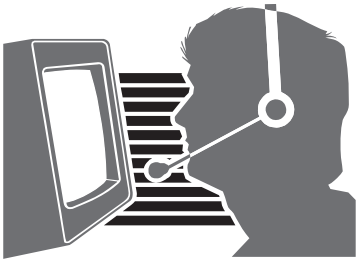
Technical Support

The TracVision antenna is a sophisticated electronic device; only KVH-authorized technicians have the specialist tools and expertise necessary to diagnose and repair a system fault. Therefore, if you experience an operating problem or require technical assistance, please call or visit your local authorized TracVision dealer or distributor. You can find an authorized technician near you by visiting our website at *www.kvh.com/wheretogetservice*.

If you need help finding an authorized technician, please contact KVH Technical Support:

North/South America, Australia:
Phone: +1 401 847-3327
E-mail: techs@kvh.com

Europe, Middle East, Asia:
Phone: +45 45 160 180
E-mail: support@kvh.dk



Please have your antenna and interface box serial numbers handy before you call. You can get these serial numbers from the interface box; see *"Viewing System Information" on page 46*.

Product Care

Please consider the following antenna care guidelines to maintain peak performance.

- Periodically wash the exterior of the antenna dome with fresh water and mild detergent. Avoid harsh cleansers and volatile solvents (such as acetone) and do not spray the dome directly with high-pressure water.

- If you wish to paint the dome, use only non-metallic automotive paint without a primer coat. Any paint that contains metal will block satellite signals and impair reception.

Appendix A
Wiring Diagram

This appendix provides a basic receiver wiring diagram. For detailed installation instructions, refer to the *Installation Guide.*

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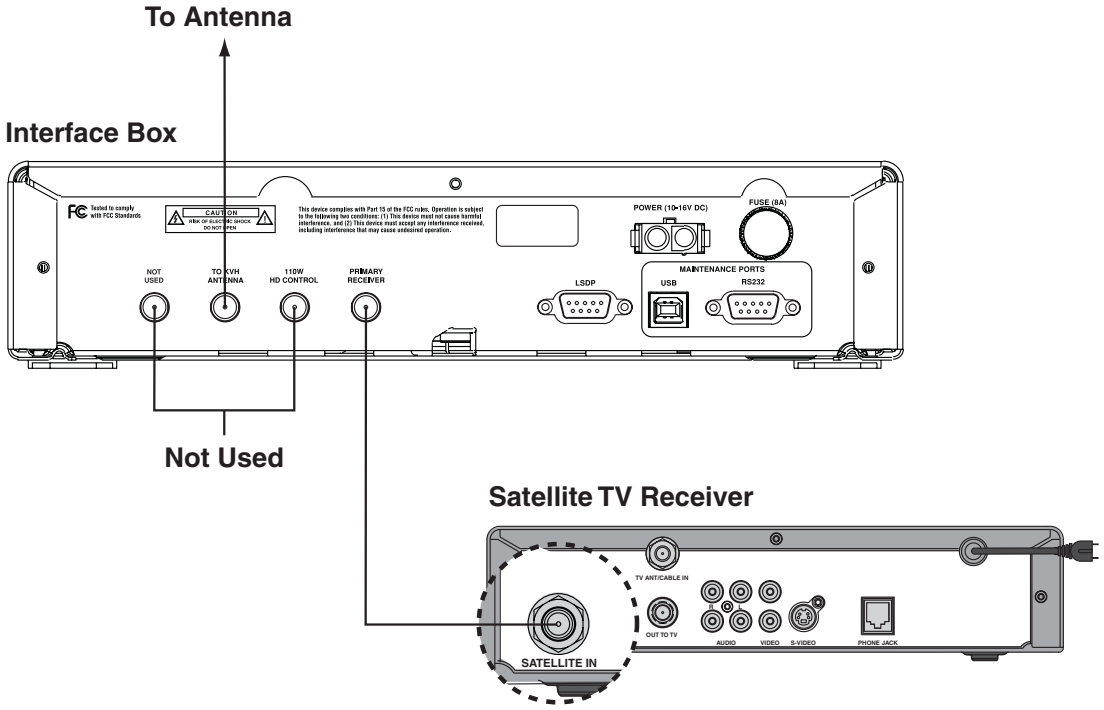
Wiring Diagram



Appendix B Menus Quick Reference Guide

This appendix provides a quick reference guide to the interface box menu structure.

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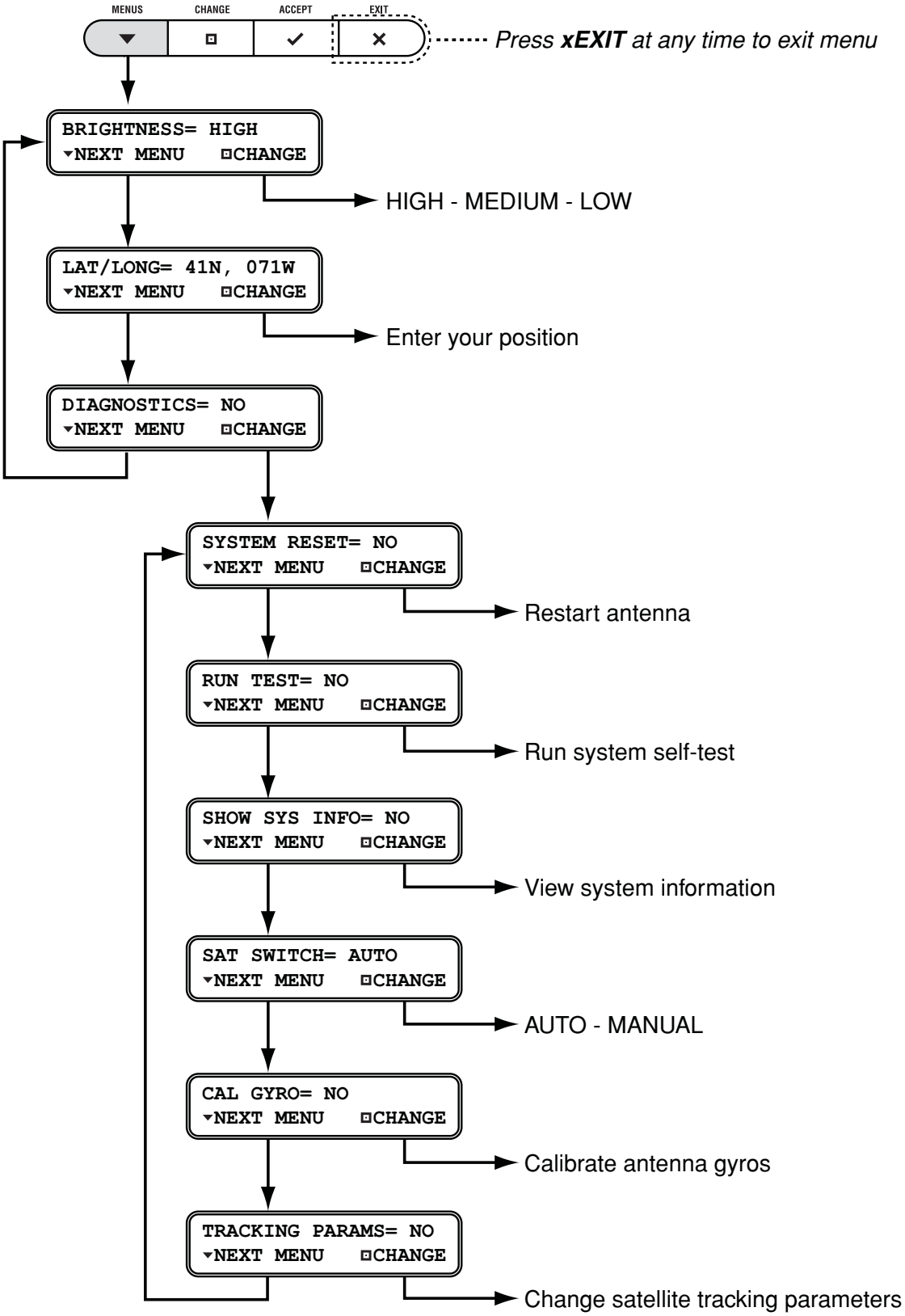
Interface Box Menus



Appendix C Programming User-Defined Satellites

This appendix explains how to program a user-defined satellite (USER A or USER B) in the antenna, if necessary. The TracVision antenna includes a library of common satellites that you can choose from without any programming required. You can find a list of these satellites in *"Selecting Satellites to Track" on page 27*. If the satellite you wish to track is not included in this list, then follow the instructions in this appendix.

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Connecting a Laptop to the Antenna

To program your user-defined satellite(s), you first need to connect a Windows® laptop computer to the TracVision system and start Windows HyperTerminal.

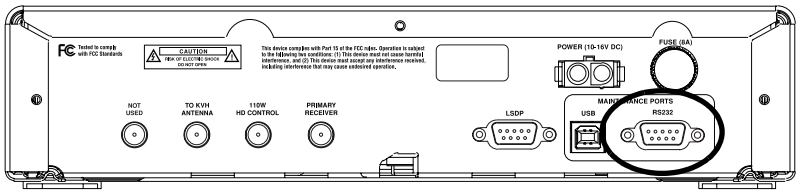
TIP: *If you are a KVH-authorized technician, you can use the KVH Flash Update Wizard instead of HyperTerminal. Enter commands in the wizard's "Antenna Comms" window. You do not need to flash the antenna to enter commands.*

1. Turn off the TracVision antenna.

2. Using a PC serial data cable, connect your laptop to the DB9 Maintenance port on the back of the interface box.

   NOTE: *If your computer does not have a DB9 serial COM port, you can use the USB-to-RS232 adapter manufactured by IOGear (IOGear part number GUC232A). As an alternative, you can also use the adapter manufactured by Belkin (Belkin part number F5U109).*

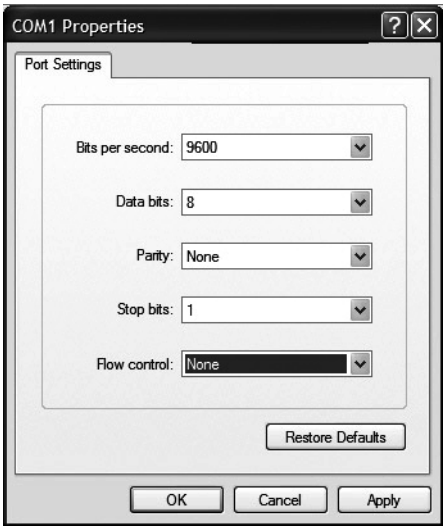
Figure C-1 Interface Box Maintenance Port



3. Open Windows HyperTerminal and establish the following settings for your COM port:

   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None

Figure C-2 HyperTerminal Settings



TIP: *To view characters on the screen as you type, set up HyperTerminal to echo typed characters. Select "Properties" from the File menu; select "ASCII Setup" at the Settings tab; then select "Echo typed characters locally" at the ASCII Setup window.*

4. Turn on the TracVision antenna. Data should soon be scrolling in your HyperTerminal window. If no data appears, check your connections and make sure you're using the correct COM port.

5. Follow the steps in the next section to program the antenna via the HyperTerminal window.

Programming Your User-Defined Satellites

To configure a user-defined satellite, you will need to program into the antenna the following information about the satellite:

- Satellite name
- Satellite longitudinal position
- Transponder information for all four combinations of polarization and band (vertical high, vertical low, horizontal high, and horizontal low):
  - Frequency
  - Symbol rate
  - FEC code
  - Network ID
- Decoder type

NOTE: *You can find this information on the web at* ***www.lyngsat.com*** *or* ***www.satcodx.com*** *(neither website is affiliated with KVH).*

To program this information into the antenna, enter the following commands via Windows HyperTerminal (see ***"Connecting a Laptop to the Antenna" on page 69***).

1. Type **HALT** then press Enter.
2. Type the following **SATCONFIG** command then press Enter:

   SATCONFIG,X,A,B,C,D

Field	Description
X	User-defined satellite stored in antenna library (**996W** = User A; **997W** = User B)
A	Longitude (0-180)
B	E (East) or W (West)
C	Decoding type (1 = DSS-A, 2 = DSS-B, 3 = DVB)
D	Polarization (L = linear)

3. Type **@DEBUGON** then press Enter.

4. Type the following **@SATCONFIG** command then press Enter:

   @SATCONFIG,X,E,F,G,H,I,J,K

Field	Description
X	User-defined satellite stored in antenna library (**996W** = User A; **997W** = User B)
E	Frequency, MHz (00000 or 10700-12700)
F	Symbol rate, kilosymbols per second (10000-45000)
G	FEC code (12, 23, 34, 56, 67, or 78)
H	Network ID, hexadecimal (0x####)
I	Polarization (V = vertical; H = horizontal)
J	LNB down conversion frequency (L = low; H = high; G = Latin America; S = Sinosat)
K	Decoding type (1 = DSS-A; 2 = DSS-B; 3 = DVB)

5. Repeat Step 4 for each polarization/band:

   - Vertical High
   - Vertical Low
   - Horizontal High
   - Horizontal Low

   If your selected satellite does not have information for one or more of these transponder categories, you can enter the following defaults instead:

Transponder Data	Default Value
Frequency	00000
Symbol rate	27500
FEC code	Same value as other transponders with valid data
Network ID	0x0000

6. Type **@DEBUGOFF** then press Enter.
7. Type **ZAP** then press Enter. The antenna restarts. Wait one minute for system startup.
8. Follow the steps in *"Selecting Satellites to Track" on page 27* to select your new USER A or USER B satellite.

Example

The following is an example of programming the fictional "YOURSAT 101" as the USER A user-defined satellite.

YOURSAT 101 at 7°W, DVB decoder, linear polarization

Transponder Data	Value
Horizontal High	
Frequency	11.966 GHz
Symbol rate	27500
FEC code	3/4
Network ID	2048 (dec) = 0x0800
Vertical High	
Frequency	11.823 GHz
Symbol rate	27500
FEC code	3/4
Network ID	2048 (dec) = 0x0800
Vertical Low	
No data listed	
Horizontal Low	
No data listed	

Based on the above information, you would enter the following commands into the antenna via your HyperTerminal connection:

```
HALT
SATCONFIG,996W,7,W,3,L
@DEBUGON
@SATCONFIG,996W,11966,27500,34,0x0800,H,H,3
@SATCONFIG,996W,11823,27500,34,0x0800,V,H,3
@SATCONFIG,996W,00000,27500,34,0x0000,V,L,3
@SATCONFIG,996W,00000,27500,34,0x0000,H,L,3
@DEBUGOFF
ZAP
```

TracVision®
BY KVH INDUSTRIES

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